

The present invention is directed to a silver halide photographic material containing a methine dye having the formula recited the present claims.

The methine dye is a sensitizing dye, as apparent from the specification, that is, it is a dye for spectral sensitizing of silver halide grains. As disclosed at page 1 of the present application, in the past, many sensitizing dyes have been made and examined, but it is not possible to know the photographic capabilities of such dyes in advance of their examination. As disclosed at page 1 of the present application, seemingly small (trace) structural differences of a sensitizing dye largely affect photographic capabilities, such as, sensitivity, fog, storage stability and residual colors after processing. As disclosed at page 2 of the present application, a sensitizing dye has been sought which improves sensitivity of silver halide grains without causing adverse effects, such as, fog, residual color, and deteriorated pressure durability.

In this rejection, the Examiner recognizes that Usagawa et al do not disclose that Z represents the rings recited in claim 1, and do not disclose the X<sup>51</sup> and X<sup>52</sup> recitations of claim 4.

The Examiner argues that in view of Table 8.3 of the cited James publication, it would have been obvious to employ an oxazole ring or a thiazole ring, instead of the pyrrole ring disclosed in compound (35) of Usagawa et al.

Table 8.3 of James discloses various cyanine dyes comprised of a 6-membered benzene ring condensed to a 5-membered ring which can be an oxazole ring, a thiazole ring or a pyrrole ring. The Examiner therefore concludes that it would have been obvious to employ an oxazole ring or a thiazole ring instead of the pyrrole ring in compound (35) of Usagawa et al.

In response, applicants point out that the present invention is characterized in that a specific azole ring (or a pyridine ring, etc.) in the methine dye is condensed with a specific hereto ring, such as a furan ring as recited in claim 1. There is no disclosure or suggestion with regard to this characteristic in James.

James does not disclose a furan ring condensed with a 5-membered or 6-membered ring. Accordingly, applicants submit that the teachings of James are not relevant to the present claims.

Usagawa et al disclose a dye where a hereto ring is condensed with a ring where X<sup>51</sup> or X<sup>52</sup> represents a dimethylmethylene group, but Usagawa et al do not disclose or suggest an oxazole ring or a thiazole ring, or any of the other rings covered by the present claims.

Further, applicants submit that one of ordinary skill would not have been led to combining the teachings of James with those of Usagawa et al because there is no motivation to do so.

In particular, and as discussed above, the present invention relates to a silver halide photographic material that contains a methine sensitizing dye, as is apparent from the specification of the present application. The sensitizing dye is for improving the sensitivity of silver halide.

On the other hand, the Usagawa et al technique, including compound (35) pointed out by the Examiner, relates to a filter dye. The filter dye is not a sensitizing dye, and is added to absorb excess light, and some cases, decreases sensitivity. In view of this, applicants submit that the present invention is totally opposite to that of Usagawa et al.

Accordingly, applicants submit there would be no motivation for combining the teachings of Usagawa et al and James to reach the present invention which targets the sensitizing dye.

In addition, applicants point out that Table 8.3 of James shows that changing the constituent atoms (carbon atom/hetero atom) of a ring brings about big differences in physical properties. Accordingly, this means that simply substituting one ring atom for another does not lead to an equivalence therebetween. Further, James does not state that the various nuclei disclosed in Table 8.3 are equivalent to the rings set forth in the present claims.

In view of the above, it is apparent that the properties of the sensitizing dye would be changed depending on the atoms constituting the ring. Therefore, applicants submit that one of ordinary skill in the art would not be led to substituting one ring atom for a different ring atom with a reasonable expectation of success.

With respect to claim 2, applicants submit that Usagawa et al do not satisfy the recitations of claim 2. Claim 2 requires that Y be selected from Y-1 to Y-26 of claim 2. Applicants submit that there is no disclosure in Usagawa et al of compounds that satisfy Y-1 to Y-26 of claim 2. The Examiner has not identified any compound in Usagawa et al that satisfies the recitations of claim 2. Further, James is not relevant to the present invention because it does not disclose any of Y-1 to Y-26. Still further, as discussed above, one of ordinary skill in the art would not be led to combining Usagawa et al with James. In addition, as discussed above, James shows that different rings have different properties and are not equivalent to each other.

With respect to claim 4, compound (35) of Usagawa et al do not satisfy formula (XX) of claim 4, since compound (35) contains a carbon atom in a position corresponding to X<sup>51</sup> and X<sup>52</sup>.

The Examiner has not addressed this argument. Further, James does not disclose a furan ring condensed with a 5-membered ring as in formula (XX). Still further, as discussed above, one of ordinary skill in the art would not be led to combining Usagawa et al with James. In addition, as discussed above, James shows that different rings have different properties and are not equivalent to each other.

With respect to claim 5, the Examiner relies on compounds (31) to (34) of Usagawa et al, at columns 11 and 12.

In the Amendment Under 37 C.F.R. § 1.116 filed on March 30, 2004 and the Amendment Under 37 C.F.R. § 1.111 filed on December 14, 2004, applicants argued that claim 5 requires that the thiophene ring be substituted with at least one halogen atom, but that the compounds (31) to (34) of Usagawa et al do not contain a halogen atom on a thiophene. Applicants also argued that  $n^{61}$  in formula (XXX) of claim 5 represents 0 or 1, whereas compounds (31) to (35) of Usagawa et al correspond to the case where  $n^{61}$  represents 3.

In the present Office Action, the Examiner does not set forth any comments in response to these arguments.

Applicants continue to rely on these arguments.

Further, James does not disclose a thiophene ring condensed with a five membered ring as in formula (XXX) of claim 5. Still further, as discussed above, one of ordinary skill in the art would not be led to combining Usagawa et al with James. In addition, as discussed above, James shows that different rings have different properties and are not equivalent to each other.

The Examiner broadly states that closely related homologs, analogs, isomers may create a prima facie case of obviousness. This statement of the Examiner, however, is insufficient to provide a basis for an obviousness rejection. As discussed above, James shows that different rings have different properties and are not equivalent to each other.

In a section entitled "Request to Arguments," beginning at page 5 of the Office Action, it appears to that the Examiner is asserting that because James, in Table 8.3, discloses various cyanine dyes that contain a condensed 5-membered ring, which can be an oxazole ring, a thiazole ring or a pyrrole ring, that any of these rings can be used with the furan ring in Usagawa et al, even though James does not disclose the furan ring of Usagawa et al. The Examiner argues that rings having oxygen atoms, sulfur atoms, nitrogen atoms or carbon atoms are equivalent to each other in a methine dye.

As discussed above, however, James shows that different rings have different properties, and are not equivalent to each other.

In general, applicants submit that the Examiner is employing hindsight to arrive at the present claims, and that there is no motivation for one of ordinary skill in the art to make the substitutions proposed by the Examiner.

In view of the above, applicants submit that Usagawa et al and James do not disclose or render obvious the subject matter of claims 1, 2, 4 and 5 and, accordingly, request withdrawal of this rejection.

Claims 1, 2, 4, 5 and 11-13 have been rejected under 35 U.S.C. § 103(a) as obvious JP 2000-63690.

The Examiner relies on compound D-38, at columns 36 to 37, and on dyes D-1 to D-146 at columns 21 to 76 for dyes that contain a thiophene ring.

The Examiner asserts that the compounds of formula (II) in JP '690 contains a Y<sup>2</sup> that can be O, S, Se, N or C, and a Q which is a group of non-metallic atoms necessary to form a benzene ring having a heterocyclic ring fused thereto, and that A<sup>2</sup> in JP '690 is a group necessary for forming a methine pigment.

The Examiner recognizes that JP '690 does not disclose the dyes of the present invention, but makes the statement that they are substantially similar to those set forth in the present claims.

The Examiner states that JP '690 does not exemplify a furan group of claim 1, or a pyrrole ring of claim 11, but asserts that the furan group is within the scope of a group of non-metallic atoms necessary to form a benzene ring having a heterocyclic ring fused thereto, as disclosed in JP '690, and further asserts that the oxygen atom (of the furan group) or the nitrogen atom (of the pyrrole group) belong to the same column of the periodic Table of Chemical Elements.

The Examiner argues that one of ordinary skill in the art would have expected that a methine dye of similar properties could be formed with the above substitutions.

The Examiner asserts that the condensed groups in claim 2 are within the scope of generic formula (II) in JP '690, where Y<sup>2</sup> are each O, S, Se, N or C, and Q is a heterocyclic compound such as the thiophene group exemplified therein.

The Examiner asserts that a prima facie case of obviousness can be made when chemical compounds have very close structural similarity and similar utilities.

With respect to claim 5, applicants have previously argued in the Amendment Under 37 C.F.R. § 1.116 filed on March 30, 2004 and the Amendment Under 37 C.F.R. § 1.111 filed on December 17, 2004 that the compound D-35 of JP '690 is a pentamethine dye and is, therefore, different from the compounds of claim 5 where  $n^{61}$  represents 0 or 1. The Examiner has not responded to this argument.

Further, with respect to the Examiner's general comments that it would have been obvious to make the substitutions necessary to arrive at the present application, applicants submit that the Examiner has not provided sound reasons why the invention is obvious, but has made a general statement which is not supported by the applicable law. The Examiner must provide specific reasons and evidence to show obviousness, and he has not done so in the present case.

In addition, as discussed above, Table 8.3 of James shows that changing the constituent atoms (carbon atom/hetero atom) of a ring brings about the big differences in physical properties. Accordingly, this means that simply substituting one ring atom for another rings atom does not lead to the equivalence therebetween.

In view of the above, it is apparent that the properties of the sensitizing dye would be changed depending on the atoms constituting the ring. Therefore, applicants submit that one of ordinary skill would not be led to substituting one ring atom for a different ring atom with a reasonable expectation of success.

Thus, even if one could expect a compound structure similar to that of the present invention, one would not expect that this compound is equivalent to the compounds of the

present claim with respect to spectroscopic property, sensitivity and residual color effect after processing.

The Examiner recognizes that JP '690 does not disclose a furan group of claim 1 or a pyrrole ring of claim 11, but asserts that the furan group is within the scope of a group of non-metallic atoms necessary to form a benzene ring having a heterocyclic ring fused together, as disclosed in JP '690, and further asserts that the oxygen atom of the furan group or the nitrogen atom of the pyrrole group belong to the same column of the Periodic Table of Chemical Elements.

Again, the Examiner sets forth the broad principle that oxygen and nitrogen in the Periodic Table of Elements is known to be equivalent to a sulfur atom in the Periodic Table of Elements, and, therefore, one could readily substitute one for the other.

Applicants submit that this is an over simplification of the prior art, and is disproved by the James publication cited by the Examiner which shows that different rings have different properties and are not equivalent to each other.

In general, applicants submit that the Examiner is employing hindsight to arrive at the present claims and there is no motivation for one of ordinary skill in the art to make the substitutions proposed by the Examiner.

Accordingly, applicants submit that JP '690 does not disclose or render obvious the subject matter of claims 5 to 9 and, therefore, request withdrawal of this rejection.

Claims 5 to 9 have been rejected under 35 U.S.C. § 103(a) as obvious over JP '250 or JP '950 in view of either Parton et al or Hioki et al.

The Examiner recognizes that JP '250 and JP '950 do not disclose a compound in which a nucleus connected to the thiophene contains an oxygen atom, a sulfur atom, a selenium atom, a nitrogen atom or a carbon atom, but relies on Parton et al and Hioki et al to show nuclei containing such atoms.

In the Amendment Under 37 C.F.R. § 1.116 filed on March 30, 2004 and the Amendment Under 37 C.F.R. § 1.111 filed on December 17, 2004, applicants argued that the Hioki et al patent is not relevant to the present claims because none of the nuclei disclosed in Hioki et al contains a thiophene condensed with a 5-membered nitrogen containing ring. Applicants similarly argued that none of the various nuclei disclosed in Parton et al are condensed with a thiophene ring as required in claim 5.

Applicants maintain these arguments.

In the Office Action, the Examiner states that a thiophene group and a heterocyclic group have been known to be associated with a methine group to form a methine dye, such as in JP '690, JP '250 or JP '950. The Examiner asserts that it would be expected for one of ordinary skill in the art that a pyrrole group or a furan group is equivalent to a thiophene group or other heterocyclic group containing chemical elements from similar groups from the Periodic Table. The Examiner asserts that the claimed dyes would have been prima facie obvious in the absence of criticality of furan, pyrrole or thiophene and the substituents associated herewith.

With respect to applicants' argument that there is no motivation to combine the various teachings of the prior art, the Examiner asserts that the prior art can be modified as long as there is a reasonable expectation of success. The Examiner argues that since the various chemical

elements are known to be equivalent to each other as shown in the Periodic Table of Elements, that one would have a reasonable expectation of success.

In response, applicants submit that the Examiner has not provided any evidence to support his assertions. Applicants submit that the Examiner's assertions are mere speculation. The Examiner has not cited any prior art to support his assertion that it would be expected in the context of the present invention that a pyrrole group or a furan group is equivalent to a thiophene group or other heterocyclic group. Further, no showing of criticality is necessary when a prima facie case of obviousness does not exist. The Examiner has not provided any motivation to make the substitutions he suggests.

In addition, applicants point out that the James publication cited by the Examiner shows that different rings have different properties and are not equivalent to each other.

In general, applicants submit that the Examiner is employing hindsight to arrive at the present claims, and that there is no motivation for one of ordinary skill in the art to make the substitutions proposed by the Examiner.

In view of the above, applicants submit that claims 5 to 9 are patentable over the cited references and, accordingly, request withdrawal of this rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

RESPONSE UNDER 37 C.F.R. § 1.116  
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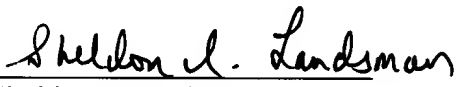
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